IRON AND STEEL

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The 8-month recession beginning in March 2001 finally ended in November 2001 and the economy began to improve slowly until the summer of 2003 (National Bureau of Economic Research, 2003§[1]; Bernanke, 2004§). The third quarter of 2003 displayed near-record levels of real economic growth, about 8%, annualized. Growth appeared to continue with strength through the fourth quarter of 2003. U.S. apparent steel consumption, an indicator of economic growth, remained at 107 million metric tons (Mt) in 2003, equal to that in 2002, the lowest amount since 1995, from a peak of 120 Mt in 2000.

During 2002, the domestic steelmaking industry received temporary relief from low-priced imports under section 201 of the 1974 Trade Act—3 years of tariffs of as much as 30% on certain steel imports. Relief from this import activity was expected to slow imports, increase steel prices, and allow the steel industry to restructure to become more competitive in world markets. Total relief from imports was nullified to some extent when the U.S. Department of Commerce exempted 727 imported steel products from the tariff in June. Therefore, contrary to expectations, 2002 became the fourth highest steel import year in U.S. history. Reaction abroad to these tariffs was swift and countered by tariffs, called "safeguards," established by the European Union (EU) and other countries. Also, the EU followed by Brazil, China, Japan, New Zealand, Norway, the Republic of Korea, and Switzerland challenged the tariffs at the World Trade Organization, which subsequently ruled against the United States. In late 2003, the Administration ended tariffs ahead of schedule on the grounds that the steel industry had enough time to restructure itself to become competitive. Almost immediately, China, Germany, Japan, Kazakhstan, Russia, the Republic Korea, Taiwan, and Ukraine terminated their safeguards and the world's steel industry returned to its earlier market-based condition.

Data regarding U.S. production of iron and steel and shipments of steel mill products were reported by the American Iron and Steel Institute (AISI). These data can be regarded as representing 100% of the raw steel producers in the United States. World production of iron and steel is reported by the International Iron and Steel Institute (IISI) and by foreign government agencies. Consistent with international usage and Federal Government policy, the U.S. Geological Survey reported all data on iron and steel in metric units unless otherwise noted.

Environment

Steel mills that receive ferrous scrap have been exposed to radioactive materials without warning and accidental meltings of radioactive scrap have cost an average of $12 million to $15 million per event. At least 26 accidental meltings of radioactive material have been reported in the United States since 1983 (U.S. Environmental Protection Agency, 2003§). Especially disturbing was the discovery of a canister containing uranium oxide, also known as "yellowcake," in a shipment of steel on December 16, 2003, by dock radioactivity sensors at the Jewometaal Stainless Processing BV facility in Rotterdam, Netherlands. This material has no use other than nuclear bomb making (American Metal Market, 2004). International investigators determined that the origin of the steel shipment containing the canister was Iraq. For more information on environmental problems in the iron and steel industry related to scrap can be found in the Iron and Steel Scrap chapter.

The U.S. Congress mandated the U.S. Maritime Administration (MARAD) to dispose of 70 obsolete ships in the 94-ship James River Reserve Fleet near Fort Eustis, VA (Washington Times, 2003). The ships, some dating back to World War II, reportedly are floating environmental hazards. Officials feared that a serious hurricane could release polychlorinated biphenyls and asbestos into the river. MARAD was negotiating with foreign companies including Able UK Ltd. in the United Kingdom, to scrap the ships in an environmentally safe manner before 2006.

The U.S. Environmental Protection Agency (EPA) proposed rules affecting steelmakers and foundries in New Jersey designed to curtail the use of automotive scrap containing mercury. The plan also includes maximum mercury emissions levels to take effect 5 years after the enactment date. The plants will buy scrap only from suppliers who remove accessible mercury switches and visually inspect shredded scrap for mercury switches before melting (Schaffer, 2003).

Brownfields are abandoned, idled, or underused industrial and commercial sites, such as steel mills, where expansion or redevelopment is complicated by real or perceived environmental contamination that can add cost, time, or uncertainty to a redevelopment project (Envirotools, 2002§). About 130,000 to 450,000 contaminated commercial and industrial sites are located in the United States, and the cost of cleaning them may be as much as $650 billion. In January 2002, the Small Business Liability Relief and Brownfields Revitalization Act (H.R. 2869) became law (Public Law 107-118). The law authorized the EPA to spend $250 million for assessment and cleanup of brownfield properties. The EPA is funding two agencies in Allegheny County, PA, to assess

[1]References that include a section mark (§) are found in the Internet References Cited section.

brownfield sites for future redevelopment (Pittsburgh Business Times, 2003§). The Urban Redevelopment Authority of Pittsburgh will receive $150,000 to assess sites contaminated with petroleum, and the West-to-West Coalition of Allegheny County will receive $300,000 to study contaminated sites in McKeesport, Clairton, Rankin, and Braddock.

Production

Production of raw steel in the United States increased to 93.7 Mt from 91.6 Mt in 2002 (table 1). The AISI estimated raw steel production capability to be 110 Mt, up from 103 Mt in 2002. Production represented 84.9% of estimated capability compared with 88.8% in 2002.

Integrated steel producers smelted iron ores to liquid iron in blast furnaces and used basic oxygen furnaces to refine this iron with some scrap to produce raw liquid steel. The basic oxygen process was used to make 45.9 Mt of steel (American Iron and Steel Institute, 2003, p. 74). The use of this process declined slightly to 49.0% of total steel production in 2003 from 49.6% in 2002. The integrated steel industry in the United States consisted of 9 companies operating ironmaking and steelmaking facilities at 17 locations (Iron and Steelmaker, 2003). Several of these companies also operated nonintegrated plants and/or other steelmaking facilities at the same locations.

Minimills and specialty mills are nonintegrated steel producers that use electric arc furnaces (EAF) to melt low-cost raw materials (usually scrap). They also employ continuous casting machines and hot-rolling mills that are often closely coupled to the casting operation. Specialty mills include producers of stainless, alloy-electrical, and tool steel; high-temperature alloys; forged ingots; and other low-volume steel products. The nonintegrated sector of the industry, about 72 companies operating about 105 steelmaking plants, used the EAF steelmaking process to produce 47.8 Mt of steel, an increase of about 4% compared with that of 2002, and accounted for 51.0% of total steelmaking (American Iron and Steel Institute, 2003, p. 75; Iron and Steelmaker, 2003).

Raw liquid steel is mostly cast into semifinished products in continuous casting machines. Only 2.7% of U.S. production was cast in ingot form and subsequently rolled into semifinished forms; this represented about the same as that of 2002. Continuous casting production was 91.1 Mt, or 97.3% of total steel production, compared with 89.1 Mt, or 97.2%, in 2002 (American Iron and Steel Institute, 2003, p. 75).

Consumption

Steel mill products are produced at a steel mill either by forging or rolling into forms normally delivered for fabrication or use. Some companies purchase semifinished steel mill products from other steel companies and use them to produce finished steel products. To avoid double counting steel mill product shipments under these circumstances, steel mills identify any shipments of steel mill products to other companies that are reporters of steel mill product shipments. The accumulated shipments of all companies less the shipments to other reporting companies are identified as net shipments.

The U.S. apparent consumption or supply of steel mill products was 107 Mt, the same as that in 2002. Shipments of steel mill products by U.S. companies increased by 6.0% to 96.1 Mt compared with those of 2002 (table 3). Export shipments by AISI reporting companies increased to 7.5 Mt from 5.4 Mt in 2002 (American Iron and Steel Institute, 2003, p. 45). Shipments to domestic customers increased by 6.0% during 2002 (American Iron and Steel Institute, 2003, p. 30). Shipments of construction and contractors' products, the largest single end-use market, decreased by 14% (American Iron and Steel Institute, 2003, p. 32). Automotive product shipments increased by 4.6% in 2003. Oil and gas, mining, quarrying, and lumbering industries shipments decreased by more than 20%. Shipments of industrial and agricultural machinery, equipment, and tools decreased by more than 10%. Steel service center shipments, appliance shipments, and containers, packaging, and shipping material shipments increased by nearly 3.6%.

Prices

The U.S. Department of Labor, Bureau of Labor Statistics, producer price index for steel mill products was up by 4.5% to 109.5 in 2003 from 104.8 in 2002 (1982 base=100) (table 1; U.S. Department of Labor, Bureau of Labor Statistics, 2004§). The index declined during the first 7 months from 109.5 in January to 108.4 and rose to a yearly high in December to 112.0.

Foreign Trade

Exports of steel mill products increased to 7.5 Mt from 5.4 Mt in 2002 (American Iron and Steel Institute, 2003, p. 45). Canada received the largest amount of U.S. exported steel, 3.9 Mt, 14% more than in 2002. Mexico was again in second place, receiving 1.43 Mt, up from 1.29 Mt in 2002 (table 4). Imports of steel mill products decreased by 29% to 21 Mt from 29.6 Mt in 2002 (American Iron and Steel Institute, 2003, p. 55). Brazil, Canada, the EU, Germany, Japan, Mexico, the Republic of Korea, and Russia were major sources of steel mill product imports.

Imports of semifinished steel (table 6) by steel companies must be taken into consideration in evaluating apparent consumption (supply) of steel mill products in the United States and the share of the market represented by imported steel. To avoid double counting the imported semifinished steel and the products produced from it, the amount of semifinished steel consumed by companies that also produced raw steel must be subtracted from domestic consumption. Between 1993 and 2003, semifinished steel imports were in a range between 2.5 million metric tons per year (Mt/yr) and 7.3 Mt/yr. Prior to 1993, the amount was less than 0.2 Mt/yr.

Taking the imported semifinished steel into consideration, the share of the U.S. steel market represented by imported steel was an estimated 20% in 2003 compared with 28% in 2002.

Regarding the reporting of imports and exports, "fabricated steel products" are produced from steel mill products but do not include products that incorporate steel products with other materials. Examples of fabricated steel products are fabricated structural steel and steel fasteners. "Other iron and steel products" refers to products that are not produced from steel mill products. Examples of other iron and steel products include iron or steel castings and direct reduced iron (DRI).

World Review

World production of pig iron totaled about 647 Mt, 6.4% more than that of 2002 (table 10). In Asia, China continued to be the leading producer of pig iron in the world, producing more than 202 Mt, 18% more than that of 2002. Japan, Russia, and the United States followed with 82 Mt, 48 Mt, and 41 Mt, respectively. The Republic of Korea's production increased slightly. Russia and Ukraine were the only major pig iron producers in the Commonwealth of Independent States (CIS). Production in Russia had increased by 18% since 1999 and was the highest in the past 5 years. During 2003, Ukrainian production continued a rising 6-year trend. In North America, the only major producer of pig iron was the United States, where production in 2003 was about the same as in 2002. In South America, the only major pig iron producer was Brazil, producing more that 29 Mt as part of a rising 5-year trend. Germany was the top producer in the EU, producing about 30 Mt, slightly more than in that of 2002. India's production increased by 2.8% from that of 2002.

DRI production worldwide was about 44.1 Mt, a 1.6% increase from that of 2002. The leading technology was the Midrex process, followed by the HYL I and the HYL III processes. During 2003, only 2.3 Mt of capacity was idle compared with 10.2 Mt in 2002 as a result of the worldwide increase in the price of DRI and ferrous scrap. The leading producer of DRI was Venezuela, followed by, in descending order of tonnage, India, Iran, and Mexico (table 10). World capacity for DRI production was estimated to be nearly 52 Mt/yr (Midrex Direct Reduction Corp., 2003). Additional DRI capacity of 0.8 Mt was under construction in the Republic of Korea.

World production of raw steel was 962 Mt, up from 906 Mt (revised) produced during 2002 (table 11). As in previous years, production varied widely among major regions of the world. Asian countries produced about 49% of the world's steel; the EU, 17%; and North America, 14%. During 2003, China was again the world's leading steel producer, exceeding 220 Mt, a gain of 21% compared with that of 2002. In descending order, the leading producers behind China were Japan, the United States, Russia, the Republic of Korea, and Germany. These six countries accounted for 60% of world production. The combined steel production of the six steel-producing countries in the CIS was more than 107 Mt, about the same as that in 2002. Russia and Ukraine remained the top producers, continuing to increase production above the recent lows of 1998 (table 11).

Outlook

In late 2002, the IISI revised its forecast of the gross domestic product (GDP) for 2003 to 2.2% from 2.9% (International Iron and Steel Institute, 2002). The IISI had considered it almost impossible to make accurate predictions because the global economic picture was so uncertain, but by late 2003, IISI believed that the confidence level regarding a global economic recovery had improved significantly (Christmas, 2003§). Although the growth projection of the GDP for 2003 was revised downward from the early projection, the GDP growth for 2004 was projected upward to 3.1%. U.S. economists polled by the Federal Reserve Bank of Chicago projected the median U.S. GDP for 2004 to be 4.2% (Moskow, 2004§). The Federal Reserve Bank forecast a stronger growth increase of the GDP in 2004, 4.5% to 5%. The International Iron and Steel Institute (2004§) estimated growth of GDP to be 4.7% and 3.6% in 2004 and 2005, respectively.

Economic activity in China continued to be an important influence on these GDP projections. China's 2003 GDP was revised upward to 8.3% from the earlier estimated 7.8%, and the 2004 GDP was projected at 8.0% (Christmas, 2003§). GDP projections for Asian countries in 2004 are India, 6.5%, the Republic of South Korea, 5.3%, Taiwan, 3.8%, Australia, 3.2%, and Japan, 1.5%. The EU-15 countries' growth rate was projected to be 2%. Of the top five economies in the EU, only the United Kingdom and Spain have projected GDP growth of more than 2% for 2004. Other GDP projections for 2004 are Ukraine, 5%, CIS, 4.6%, Turkey, 4.5%, Russia, 4.4%, North American Free Trade Agreement countries, 3.7%, and South America, 3.5%.

Steel consumption in China is estimated to increase by 13.1% in 2004 and by 10.4% in 2005 (Hunt, 2004). China's finished steel-product consumption during 2001 to 2003 increased 22.2% yearly, while steel consumption increases in the rest of the world were 2.2% yearly. The IISI revised upward projections of world consumption of finished steel products from 4.9% to 6.4% for 2003, 6.2% for 2004, and 4.5% in 2005 (Hunt, 2004; Christmas, 2003§). China's share of global steel consumption for 2005 is an estimated 30% and an estimated 61% for the years 2004 and 2005.

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TABLE 1
SALIENT IRON AND STEEL STATISTICS[1]

(Thousand metric tons unless otherwise specified)

	1999	2000	2001	2002	2003
United States:					
Pig iron:					
Production[2]	46,300	47,900	42,100	40,200	40,600
Exports[3]	82	72	44	34	86
Imports for consumption[3]	4,990	4,970	4,370	4,620	3,890
Direct-reduced iron:					
Production[4]	1,670	1,560	120 r	470	210
Exports[3]	3	2	1	1	5
Imports for consumption[3]	950	1,090	1,650	2,010	1,940
Raw steel production:[5]					
Carbon steel	87,600	92,500	82,400	83,700	86,100
Stainless steel	2,190	2,190	1,820	2,180	2,220
All other alloy steel	7,650	7,510	5,920	5,680	5,350
Total	97,400	102,000	90,100	91,600	93,700
Capability utilization percent	83.8	86.1	79.2	88.8	84.9
Steel mill products:					
Net shipments[2]	96,300	98,900	89,700	90,700	96,100
Exports[3]	4,920	5,920	5,570	5,450	7,460
Imports[3]	32,400	34,400	27,300	29,600	21,000
Producer price index for steel mill products (1982=100.0)[6]	105.3	108.4	101.3	104.8	109.5
World production:[7]					
Pig iron	539,000	573,000	585,000 r	608,000 r	647,000
Direct-reduced iron[4]	38,200	42,400 r	39,300	43,400 r	44,100
Raw steel	784,000	850,000 r	852,000 r	906,000 r	962,000

rRevised.

[1]Data are rounded to no more than three significant digits, except prices; may not add to totals shown.

[2]Data are from the American Iron and Steel Institute (AISI).

[3]Data are from the U.S. Census Bureau.

[4]Data are from the Midrex Direct Reduction Corp., Government, and companies.

[5]Raw steel is defined by AISI as steel in the first solid state after melting, suitable for rolling.

[6]Data are from the U.S. Department of Labor, Bureau of Labor Statistics.

[7]Data are from the U.S. Geological Survey and the International Iron and Steel Institute.

TABLE 2

MATERIALS CONSUMED IN BLAST FURNACES AND PIG IRON PRODUCED[1]

(Thousand metric tons)

Material	2002	2003
Iron oxides:[2]		
Ores	234	193
Pellets	48,400	50,400
Sinter[3]	8,870	8,850
Total	57,500	59,500
Scrap[4]	907	1,040
Coke[2]	15,800	15,400
Pig iron, produced	40,200	40,600

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]American Iron and Steel Institute.

[3]Includes sintered ore and pellet fines, dust, mill scale, and other revert iron-bearing materials; also some nodules.

[4]Mainly briquetted turnings and borings, shredded scrap, etc.; scrap produced at blast furnaces and remelt not included.

TABLE 3

DISTRIBUTION OF SHIPMENTS OF STEEL MILL PRODUCTS, BY STEEL TYPE, PRODUCT, AND MARKET[1]

(Thousand metric tons unless otherwise specified)

	Quantity		Percentage	
	2002	2003	2002	2003
Shipments by steel type:				
Carbon steel	84,400	90,100	93.10	93.69
Alloy steel	4,540	4,280	5.01	4.45
Stainless steel	1,720	1,790	1.89	1.86
Total	90,700	96,100	100.00	100.00
Steel mill products:				
Ingots, blooms, billets and slabs	1,130	1,440	1.24	1.49
Wire rods	2,900	3,150	3.19	3.28
Structural shapes, heavy	5,600	6,230	6.18	6.48
Steel piling	450	492	0.50	0.51
Plates, cut lengths	4,540	4,730	5.01	4.92
Plates, in coils	3,340	3,730	3.68	3.88
Rails	541	518	0.60	0.54
Railroad accessories	176	161	0.19	0.17
Bars, hot-rolled	6,390	5,840	7.04	6.08
Bars, light-shaped	1,040	1,220	1.14	1.27
Bars, reinforcing	6,060	7,380	6.68	7.68
Bars, cold finished	1,310	1,320	1.44	1.37
Tool steel	24	23	0.03	0.02
Pipe and tubing, standard pipe	1,200	1,070	1.32	1.11
Pipe and tubing, oil country goods	1,200	1,560	1.33	1.62
Pipe and tubing, line pipe	992	636	1.09	0.66
Pipe and tubing, mechanical tubing	765	706	0.84	0.73
Pipe and tubing, pressure tubing	22	17	0.02	0.02
Pipe and tubing, stainless	17	132	0.02	0.14
Pipe and tubing, structural	127	39	0.14	0.04
Pipe for piling	37	14	0.04	0.01
Wire	656	515	0.72	0.54
Tin mill products, blackplate	258	275	0.28	0.29
Tin mill products, tinplate	2,100	2,190	2.32	2.28
Tin mill products, tin-free steel	639	619	0.70	0.64
Tin mill products, tin coated sheets	102	103	0.11	0.11
Sheets, hot-rolled	17,600	19,900	19.44	20.71
Sheets, cold-rolled	11,500	12,300	12.69	12.76
Sheets and strip, hot dip galvanized	13,600	13,800	14.97	14.36
Sheets and strip, electrogalvanized	2,330	2,320	2.56	2.41
Sheets and strip, other metallic coated	1,920	1,780	2.12	1.85
Sheets and strip, electrical	401	380	0.44	0.40
Strip, hot rolled	151	63	0.17	0.07
Strip, cold rolled	1,570	1,510	1.73	1.57
Total	90,700	96,100	100.00	100.00
Shipments by markets:				
Service centers and distributors	24,900	25,900	27.47	26.94
Construction	18,600	21,600	20.54	22.45
Automotive	12,700	14,400	13.99	14.99
Machinery	1,270	1,070	1.40	1.11
Containers	2,940	2,750	3.24	2.86
All others	30,300	30,400	33.36	31.66
Total	90,700	96,100	100.00	100.00

[1]Data are rounded to no more than three significant digits, except percentages; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 4

U.S. IMPORTS AND EXPORTS OF STEEL MILL PRODUCTS, BY COUNTRY[1]

(Thousand metric tons)

Country	2002		2003	
	Imports	Exports	Imports	Exports
Argentina	387	2	369	3
Australia	677	3	--	7
Brazil	3,550	15	1,940	12
Canada	5,240	3,420	4,830	3,910
China	750	34	583	692
European Union	4,820	173	3,510	645
Japan	1,480	13	933	13
Korea, Republic of	1,680	7	1,080	13
Mexico	3,410	1,290	2,920	1,430
Russia	1,650	--	295	--
South Africa	389	2	--	4
Sweden	170	1	170	1
Taiwan	345	11	173	71
Turkey	1,240	--	900	--
Ukraine	337	--	75	--
Venezuela	444	18	--	14
Other	3,090	455	3,210	297
Total	29,600	5,450	21,000	7,110

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 5
U.S. EXPORTS OF IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2002	2003
Steel mill products:		
Ingots, blooms, billets, slabs	102	211
Wire rods	60	77
Structural shapes, heavy	270	463
Steel piling	7	11
Plates, cut lengths	491	587
Plates, in coils	292	493
Rails, standard	60	29
Rails, other	17	21
Railroad accessories	10	20
Bars, hot-rolled	390	355
Bars, light-shaped	81	93
Bars, concrete reinforcing	153	254
Bars, cold-finished	93	113
Tool steel	22	14
Pipe and tubing, standard pipe	75	72
Pipe and tubing, oil country goods	177	266
Pipe and tubing, line pipe	240	124
Pipe and tubing, mechanical tubing	5	7
Pipe and tubing, stainless	26	35
Pipe and tubing, nonclassified	278	239
Pipe and tubing, structural	101	110
Pipe for piling	2	4
Wire	135	127
Tin mill products, blackplate	2	20
Tin mill products, tinplate	212	259
Tin mill products, tin-free steel	19	26
Sheets, hot-rolled	408	1,390
Sheets, cold-rolled	533	851
Sheets and strip, hot-dip galvanized	452	451
Sheets and strip, electrogalvanized	153	115
Sheets and strip, other metallic coated	138	129
Sheets and strip, electrical	80	101
Strip, hot-rolled	99	131
Strip, cold-rolled	268	259
Total	5,450	7,460
Fabricated steel products:		
Structural shapes, fabricated	202	201
Rails, used	9	36
Railroad products	12	25
Wire rope	8	10
Wire, stranded products	37	30
Wire, other products	17	21
Springs	77	79
Nails and staples	27	23
Fasteners	306	371
Chains and parts	23	25
Grinding balls	17	60
Pipe and tube fittings	32	36
Other[2]	106	46
Total	873	963
Grand total	6,320	8,420

See footnotes at end of table.

TABLE 5--Continued
U.S. EXPORTS OF IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2002	2003
Cast iron and steel products:		
Cast steel pipe fittings	32	36
Cast iron pipe and fittings	95	68
Cast steel rolls	8	13
Cast grinding balls	31	26
Granules, shot and grit	21	22
Other castings	41	41
Total	228	206

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes shapes cold formed, sashes and frames, fence and sign post, architectural and ornamental work, and conduit.

Source: American Iron and Steel Institute.

TABLE 6
U.S. IMPORTS OF MAJOR IRON AND STEEL PRODUCTS[1]

(Thousand metric tons)

	2002	2003
Steel mill products:		
Ingots, blooms, billets, and slabs	8,020	4,370
Wire rods	3,170	1,970
Structural shapes-heavy	656	496
Steel piling	145	91
Plates, cut lengths	765	514
Plates, in coils	884	503
Rails and railroad accessories	218	155
Bars, hot-rolled	1,470	1,390
Bars, light-shaped	171	179
Bars, reinforcing	1,160	924
Bars, cold-finished	263	246
Tool steel	141	163
Pipe and tubing, standard pipe	989	895
Pipe and tubing, oil country goods	444	688
Pipe and tubing, line pipe	1,030	859
Pipe and tubing, mechanical tubing	488	485
Pipe and tubing, pressure tubing	94	64
Pipe and tubing, stainless	76	86
Pipe and tubing, nonclassified	21	18
Pipe and tubing, structural	351	366
Pipe for piling	14	10
Wire	697	686
Tin mill products-blackplate	90	42
Tin mill products-tinplate	254	282
Tin mill products-tin-free steel	105	74
Sheets, hot-rolled	3,520	2,100
Sheets, cold-rolled	1,730	1,200
Sheets and strip, hot-dip galvanized	1,920	1,420
Sheets and strip, electrogalvanized	166	110
Sheets and strip, other metallic coated	299	282
Sheets and strip, electrical	64	73
Strip, hot-rolled	89	89
Strip, cold-rolled	148	147
Total	29,600	21,000
Fabricated steel products:		
Structural shapes, fabricated	710	620
Rails, used	195	207
Railroad products	78	87
Wire rope	100	114
Wire-stranded products	191	204
Springs	433	446
Nails and staples	681	728
Fasteners	1,080	1,140
Chains and parts	98	109
Pipe and tube fittings	151	136
Other	522	516
Total	4,240	4,300
Grand total	33,900	25,300
Cast iron and steel products:		
Cast steel pipe fittings	151	136
Cast iron pipe and fittings	43	44
Other products	375	365
Total	569	545

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 7
U.S. IMPORTS OF STAINLESS STEEL[1]

(Metric tons)

Product	2002	2003
Semifinished	265,000	183,000
Plate	60,200	53,900
Sheet and strip	45,800	53,900
Bars and shapes	84,000	72,900
Wire and wire rods	78,800	66,900
Pipe and tube	75,600	95,200
Total	609,000	526,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 8
U.S. SHIPMENTS OF IRON AND STEEL CASTINGS[1]

(Thousand metric tons)

	2002	2003
Ductile iron castings	3,690	NA
Gray iron castings	3,990	NA
Malleable iron castings	115	NA
Steel castings	599	NA
Steel investment castings	60	NA
Total	8,450	NA

NA Not available.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 9
COAL AND COKE AT COKE PLANTS[1, 2]

(Thousand metric tons)

	2002	2003
Coal, consumption	20,400	22,000
Coke:[3]		
Production	14,600	15,600
Exports	539	655
Imports	2,810	2,760
Consumption, apparent	17,200	17,600

[1]Data are rounded to no more than three significant digits.
[2]Includes furnace and merchant coke plants.
[3]Coke production and consumption do not include breeze.

Source: Energy Information Administration, Quarterly Coal Report, DOE/EIA-0121(2001/4Q).

TABLE 10

PIG IRON AND DIRECT-REDUCED IRON: WORLD PRODUCTION, BY COUNTRY[1, 2, 3, 4]

(Thousand metric tons)

Country[5]	1999	2000	2001	2002	2003[e]
Albania[e]	10	10	10	10	10
Algeria[e]	1,000	1,100	1,250	1,300 [r]	1,300
Argentina:					
Pig iron	1,985	2,188	1,909	1,910	2,000 [6]
Direct-reduced iron	989	1,420	1,280	1,450	1,500 [6]
Australia	7,468	7,000 [e]	7,200 [e]	7,300	7,300
Austria	3,913	4,318	4,300	4,300	4,300
Belgium	8,472	8,472	7,732	8,053	8,000
Bosnia and Herzegovina[e]	100	100	100	100	100
Brazil:					
Pig iron	25,060	27,723	27,781 [r]	29,600 [r]	29,600 [6]
Direct-reduced iron	400	418	400 [e]	400	400
Bulgaria	1,130	1,220	1,160	1,072 [r]	1,100
Burma:[e]					
Pig iron	2	2	2	2	2
Direct-reduced iron	40	40	40	40	40
Canada:					
Pig iron	8,783	8,900	8,780 [r]	8,800	8,800
Direct-reduced iron	920	920	920	920	920
Chile	1,030	1,065	897	964	1,000 [6]
China[7]	125,390	131,010	155,540	170,850 [r]	202,310 [6]
Colombia	264	272	319	309	300
Czech Republic	4,022	4,621	4,671	4,840 [r]	4,800
Egypt:					
Pig iron[e]	1,300	1,400	1,400	1,800 [r]	1,500
Direct-reduced iron	1,670	2,110	2,370	2,530	2,870
Finland	2,954	2,983	2,852 [r]	2,828 [r]	2,800
France	13,854	13,621	12,004	13,217	13,000
Germany:					
Pig iron	27,931	30,846	29,184	29,419	30,000
Direct-reduced iron	400	400 [e]	400	400	400
Hungary	1,309	1,340	1,226	1,306	1,300
India:					
Pig iron	20,139	21,321	21,900	24,315 [r]	25,000
Direct-reduced iron	5,220	5,440	5,590	5,731 [r]	5,800
Indonesia, direct-reduced iron[e]	1,740	1,820	1,480	1,500	1,230
Iran:					
Pig iron	2,147	2,202	2,300	2,400	2,300
Direct-reduced iron	4,120	4,740	5,000 [e]	5,280	5,620
Italy	10,509	11,223	10,650	9,736	10,000
Japan	74,520	81,071	78,836	80,979	82,091 [6]
Kazakhstan	3,438	4,000	3,907	4,089	4,140
Korea, North[e]	800	800	800	800	800 [6]
Korea, Republic of	23,329	24,937	25,898	26,570 [r]	27,467 [6]
Libya, direct-reduced iron	1,330	1,500 [e]	1,090	1,170	1,340
Malaysia, direct-reduced iron[e]	1,000	1,260	1,120 [r]	1,080 [r]	1,600 [6]
Mexico:					
Pig iron	4,808	4,856	4,363 [r]	3,996 [r]	4,100
Direct-reduced iron	6,070	5,589	3,674 [r]	4,574 [r]	4,600
Morocco[e]	15	15	15	15	15
Netherlands[8]	5,320	4,969	5,305	5,381	5,300
New Zealand	620	600 [e]	600 [e]	600	600
Norway[e]	60	60	60	80 [r]	80
Pakistan[e]	1,500	1,500	1,500	1,500	1,500
Paraguay	61	82	71	80	80

See footnotes at end of table.

TABLE 10--Continued

PIG IRON AND DIRECT-REDUCED IRON: WORLD PRODUCTION, BY COUNTRY[1, 2, 3, 4]

(Thousand metric tons)

Country[5]	1999	2000	2001	2002	2003[e]
Peru:					
Pig iron	250	327	330	330	330
Direct-reduced iron	50	80	80	80	80
Poland	6,128	6,492	5,440	5,296 [r]	5,300
Portugal	389	382	82	--	--
Qatar, direct-reduced iron	670	620	730	750	780
Romania	2,969	3,069	3,085 [r]	2,488 [r]	2,500
Russia:					
Pig iron	40,854	44,618	44,980	46,060	48,368 [6]
Direct-reduced iron	1,880	1,920 [r]	2,510 [r]	2,910 [r]	2,900
Saudi Arabia, direct-reduced iron	2,343	3,090	2,880	3,290	3,290
Serbia and Montenegro	135	563	461	485	550
Slovakia	2,987	3,167	3,255	3,523 [r]	3,500
South Africa:					
Pig iron	4,587	6,292 [r]	5,820 [r]	5,823 [r]	5,891 [6]
Direct-reduced iron	1,260	1,530	1,560	1,700	1,540
Spain	4,146	4,059	4,094	3,978	4,000
Sweden	3,212	3,146	3,614	3,703 [r]	3,700
Switzerland[e]	100	100	100	100	100
Taiwan	9,020	9,971 [r]	10,316	10,524	10,799 [6]
Trinidad and Tobago, direct-reduced iron	1,379	1,530	2,186	2,316 [r]	2,300
Tunisia	178	196	192	152	50
Turkey	315	300	248 [r]	158 [r]	200
Ukraine	21,937	25,700	26,400	27,560	29,570 [6]
United Kingdom	12,399	10,891	9,861	8,579	8,500
United States:					
Pig iron	46,300	47,900	42,100	40,200	40,600 [6]
Direct-reduced iron	1,700 [r]	1,600	120	470	210 [6]
Venezuela, direct-reduced iron	5,071	6,401 [r]	5,903 [r]	6,824 [r]	6,645 [6]
Zimbabwe[e]	270	277 [r]	156 [r]	122 [r]	131
Grand total	578,000	616,000	624,000 [r]	651,000 [r]	691,000
Of which:					
Pig iron	539,000	573,000	585,000 [r]	608,000 [r]	647,000
Direct-reduced iron	38,200	42,400 [r]	39,300	43,400 [r]	44,100

[e]Estimated. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Production is pig iron unless otherwise specified.

[3]Direct-reduced iron is obtained from ore by reduction of oxides to metal without melting.

[4]Table excludes ferroalloy production except where otherwise noted. Table includes data available through August 10, 2004.

[5]In addition to the countries listed, Vietnam has facilities to produce pig iron and may have produced limited quantities during 1999-2003, but output is not reported and available information is inadequate to make reliable estimates of output levels.

[6]Reported figure.

[7]Figures reported by State Statistical Bureau that the Chinese Government considers as official statistical data.

[8]Includes blast furnace ferroalloys.

TABLE 11

RAW STEEL: WORLD PRODUCTION, BY COUNTRY[1, 2, 3]

(Thousand metric tons)

Country[4]	1999	2000	2001	2002	2003[e]
Albania[e]	15	65	94	100	100
Algeria	758	842	850	1,091 [r]	1,051 [5]
Argentina	3,797	4,472	4,107	4,363	5,044 [5]
Australia	8,158	7,812	7,600	8,242	8,300
Austria	5,213	5,725	5,887	6,208	6,200
Bangladesh[e, 6]	36	35	30	30	25
Belarus	1,449	1,623	1,500	1,500 [e]	1,570
Belgium	10,972	11,637	10,783	11,495	11,000
Bosnia and Herzegovina[e]	60	77	84	85	90
Brazil[7]	24,600 [r]	27,865	26,718 [r]	29,605 [r]	29,600
Bulgaria	1,889	2,017	1,942	1,860 [r, e]	1,900
Burma[e]	24	24	24	24	24
Canada	16,300	15,900	16,300	16,300	16,300
Chile[7]	1,291	1,352	1,247 [r]	1,279 [r]	1,377 [5]
China[8]	124,260	128,500	151,630	182,370 [r]	220,120 [5]
Colombia	534	660	638	664 [r]	668 [5]
Croatia	77	71	58	34 [r]	35
Cuba	303	327	270	264 [r]	225
Czech Republic	5,613	6,216	6,316	6,512 [r]	6,500
Denmark	748	803	746	392 [e]	--
Dominican Republic	43	36	33 [r]	61 [r]	60
Ecuador	53	58	60	67	80 [5]
Egypt	2,619	2,820 [e]	3,800	4,358 [r]	4,315 [5]
El Salvador	34	41	39	49	57 [5]
Finland	3,956	4,096	3,938	4,004	4,766 [5]
France	20,211	21,002	19,431	20,524	20,000
Georgia	7	(9) [r]	-- [r]	-- [r]	--
Germany	42,056	46,376	44,775	44,999	45,000
Ghana, all from scrap	75	75	75	75 [e]	75
Greece	951	1,056	1,281	1,835	1,800
Guatemala	80	166	202	216	226 [5]
Hong Kong[e]	450	500	500	500	500
Hungary	1,813	1,871	2,056	2,141 [r]	2,100
India	24,269	26,924	27,291	28,814	31,779 [5]
Indonesia[e]	2,890	3,010	2,780	2,460 [r]	2,500
Iran	6,277	6,600	6,890 [r]	7,293 [r]	7,869 [5]
Iraq[e]	50	50	50	-- [r]	--
Ireland	335	375	110	--	--
Israel[e]	280	270	220	150	150
Italy	24,964	26,544	26,483	25,930	26,000
Japan	94,192	106,444	102,866	107,745	110,511 [5]
Jordan[e]	30	30	30	30	30
Kazakhstan	4,116	4,770	4,691	4,868	5,067 [5]
Korea, North[e]	1,000	1,000	1,000	1,000	1,000
Korea, Republic of	41,042	43,107	43,852	45,390	46,306 [5]
Latvia	484	500	510 [e]	505 [e]	500
Libya	945	1,055	846 [e]	886 [r]	989 [5]
Luxembourg	2,477	2,571	2,725	2,736	2,700
Macedonia	49	50	50	50 [e]	50
Malaysia	2,770	3,650	4,100	4,722 [r]	4,700
Mauritania	5	5	5 [e]	5 [e]	5
Mexico	15,243	15,586	13,292	14,051	15,237 [5]
Moldova	796	909	966	514 [r]	500
Morocco[e]	5	5	5	5	5
Netherlands	6,075	5,667	6,037	6,144	6,000
New Zealand	744	765	770 [e]	750 [e]	750

See footnotes at end of table.

TABLE 11--Continued
RAW STEEL: WORLD PRODUCTION, BY COUNTRY[1, 2, 3]

(Thousand metric tons)

Country[4]	1999	2000	2001	2002	2003[e]
Norway	611	620	635	694 [e]	698
Pakistan[e]	500	500	500	500	500
Paraguay	56	77	71	80	91 [5]
Peru	559	749	750 [e]	750 [e]	750
Philippines[e]	530 [5]	530	530	530	340
Poland	8,853	10,498	8,809	8,369	8,400
Portugal	1,044	1,060	728	800 [e]	800
Qatar	629	744	908	1,027 [r]	1,054 [5]
Romania	4,392	4,770	4,930	5,491 [r]	5,500
Russia	51,524	59,098	59,030	59,777	62,710 [5]
Saudi Arabia	2,610	2,973	3,413	3,570 [r, e]	3,944 [5]
Serbia and Montenegro	226	682	598	596	700
Singapore[e]	500	500	400	400	400
Slovakia	3,569	3,447	3,676	4,275 [r]	4,000
Slovenia	405	519	462	481 [r, e]	500
South Africa	6,830	8,481	8,821	9,095 [r]	9,486 [5]
Spain	14,886	15,920	16,500	16,358	16,000
Sri Lanka[e]	30	30	30	30	30
Sweden	5,075	5,227	5,518	5,754	5,707 [5]
Switzerland	1,037	1,140	1,000	1,000 [e]	1,000
Syria[e]	70	70	70	70	70
Taiwan	16,027	17,302	17,336	18,255	18,563 [5]
Thailand	1,532	2,100	2,127	2,538 [r]	2,500
Trinidad and Tobago	762	753	696	839 [r]	900
Tunisia	229	237	239	200 [r, e]	86
Turkey	14,309	14,325	14,382 [r]	16,046 [r]	18,298 [5]
Uganda[e]	8	7	7	7	7
Ukraine	27,390	31,780	33,110	34,538	36,900
United Kingdom	16,634	15,022	13,610	11,718	12,000
United States	97,400	102,000	90,000 [r]	91,600	93,700 [5]
Uruguay	45	38	31	34	41 [5]
Uzbekistan	343 [e]	420	460	450 [e]	472
Venezuela	3,261	3,835	3,813	4,164	3,930 [5]
Vietnam	308	306	319	409 [r]	450
Zimbabwe[e]	255	258	149 [r]	105 [r]	152
Total	790,000 [r]	850,000 [r]	852,000 [r]	906,000 [r]	962,000

[e]Estimated. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Steel formed in solid state after melting, suitable for further processing or sale; for some countries, includes material reported as "liquid steel," presumably measured in the molten state prior to cooling in any specific form.

[3]Table includes data available through August 2, 2004.

[4]In addition to the countries listed, Mozambique is known to have steelmaking plants, but available information is inadequate to make reliable estimates of output levels.

[5]Reported figure.

[6]Data for year ending June 30 of that stated.

[7]Excludes castings.

[8]Figures reported by State Statistical Bureau that Chinese Government considers as official statistical data.

[9]Less than 1/2 unit.